

the cases. For instance, although more cases in our table are reported to have died than to have recovered, it is certain that this by no means indicates the actual relative mortality of the disease in childhood. This is partly explained by the fact that in 89 cases the result is not stated. It may be assumed that recovery took place in nearly all of these. There is also probably a greater disposition to report the fatal cases as being more unusual. The failure to recognize the milder cases has already been alluded to.

It seems to us that the main point at issue, the fact that typhoid fever is *not* so uncommon in early life as often claimed, may be considered established, not only by our own individual experience, but still more strongly by the reports of cases in medical literature.

ADDENDUM.—Since the reading of the above paper, details of at least half a dozen cases of typhoid fever in children of two years and less have been given to us by several colleagues who have not considered publication of the matter worth while. There has also occurred in the experience of one of us a well-marked and fatal case in a child of nine months. All these cases sustain the point which we have advanced, namely, that the disease is much more frequent in early life than the common belief or even published reports would indicate.

CLINICAL OBSERVATIONS ON CONGENITAL AND ACQUIRED TRANSPOSITION OF THE VISCERA.

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CASES of *situs viscerum inversus* have until recent years been discovered, studied, and reported chiefly by anatomists and pathologists. As a result of a correspondence with a large number of medical men of experience and prominence it would seem to me that the pendulum has swung about of late years, and that now a much larger percentage of these cases is discovered by the clinician. This fact is a natural result of the much more frequent and careful physical examinations that are now being made. However, even with this improvement, all physicians know that a very small percentage of even sick people submit to careful physical examination, and that the percentage of the entire population who are thus examined is extremely small.

Situs viscerum inversus is of great interest to the embryologist and anatomist. To the internist it presents very instructive problems in physical diagnosis.

Gruber made a remarkable collection of all cases found in the literature up to the year 1865. Of the seventy-nine cases which he reports only five or six were discovered during life. This fact seems rather remarkable, since his report covers more than two centuries. In 1643 Petrus Servius reported the first case as occurring at Rome.

Küchenmeister, up to the year 1888, collected 149 cases. The majority of these were discovered in the anatomical laboratory and on the post-mortem table. Pic, in 1895, increased the number of reported cases to 190.

Cases of partial situs inversus are not so common as those of complete transposition. Lochte, up to the year 1894, collected thirteen cases of this incomplete variety. In more than half very poor descriptions were given.

An attempt to collect all of the cases of situs viscerum inversus is extremely difficult and unsatisfactory, because they are reported in the literature under numerous headings. Perhaps something like 300 of these cases have been reported.

Since the spring of 1897 I have seen in hospital and private practice four cases of transposition of the viscera. It is a rather remarkable fact that three of these rare cases were seen within the short period of six months, an experience which I doubt being equalled even in the largest hospitals of the country. I am also familiar with three other cases of situs inversus discovered in the living subject by members of the internal medical staff, two by Dr. Warthin and one by Dr. Cowie.

The case which I saw first was with Dr. Chadbourne, in June, 1897, and has been reported by him and perhaps by a number of others, as he was a professional freak who went the rounds of medical schools exhibiting his anatomical abnormality for a compensation. This same patient, Schupfel by name, again presented himself at the hospital in July, 1902, and was demonstrated to my summer school section. He showed a complete transposition of the viscera, so far as could be demonstrated by clinical means. Inflation of the stomach and colon showed these viscera to be transposed. (Fig. 1.)

The three cases which I present in this article are bona fide patients—two farmers and a dental student—who learned for the first time of their peculiar abnormality.

My experience inclined me to believe that this condition was much more frequently detected in the living patient than one would infer from the literature. Acting upon this belief, nearly two years ago I sent letters to a number of prominent clinicians asking them the number of cases of congenital transposition of the viscera they had encountered in their work. Letters were also sent to a number of anatomists. The following interesting statements were received:

Dr. William Osler, Johns Hopkins: "Since the opening of the hospital we have seen, I should say, at least six cases."

Dr. Eshner, Philadelphia Polyclinic: "I beg to state that I cannot recall having seen a case of transposition of the viscera."

Dr. J. C. Wilson, Jefferson Medical College, Philadelphia: "I have encountered three demonstrable cases of transposition of the viscera, all adult males."

FIG. 1.



The upper curved line on the patient's right indicates the area of absolute cardiac dulness. The X just below this indicates the apex-beat. The curved line on the patient's right side indicates the splenic dulness. The straight line on the patient's left side indicates the upper border of the liver dulness; the small X indicates the lower border. The lowest curved line indicates the greater curvature of the stomach.

Dr. R. H. Fitz, Harvard Medical College: "I do not recall the number of living cases seen; I have no recollection of having examined after death a case of dextrocardia."

Dr. Warren Coleman, New York: "I do not recall having seen a case with transposition of the viscera."

Dr. I. N. Danforth, Chicago: "I never saw such a case in my life."

Dr. Allen Jones, Buffalo: "I have not seen a case of dextrocardia."

Dr. Frank Billings, Rush Medical College, Chicago: "I have seen

three cases of congenital transposition of the heart and abdominal viscera in my private and hospital work—one discovered in a babe about two weeks old, one in a young man between twenty and thirty years, and one in a man aged sixty-six years. The last suffered from gallstones, and was operated upon by Dr. Fenger, of Chicago. All three were unrecognized until the time when I first saw each case. Besides these three I have seen a case in a young man who travelled about exhibiting himself in medical schools."

Dr. John H. Musser, University of Pennsylvania, Philadelphia: "I have never seen any cases of congenital dextrocardia except those belonging to and reported by other physicians, as Dr. J. Dutton Steele and Dr. Joseph Sailer."

Dr. J. M. Anders, Medico-Chirurgical College, Philadelphia: "Three cases, but they have been seen while visiting various institutions here and elsewhere."

Dr. R. O. Cabot, Harvard Medical College: "I have seen two cases of transposition of the viscera. They were hospital cases in the service of Dr. Shattuck."

Dr. H. B. Newberry, Denver: "I have seen two cases—one a child, aged two or three years, also reported by Dr. J. A. Hall, and seen in consultation with him; a second in a young adult whom I was examining for life insurance. The abdominal viscera were displaced in both cases, as shown by the liver."

Dr. James Tyson, University of Pennsylvania, Philadelphia: "I recall only one well-remembered instance of transposition of the viscera occurring in my clinical experience. I remember seeing one other case years ago in a dissecting-room."

Dr. James Munson, Superintendent Michigan Insane Asylum at Traverse City: "While a member of the staff of the Pontiac (Michigan) Asylum I saw a case in which the diagnosis of complete transposition of the viscera was not made *intra vitam*, but at autopsy. During the last year of his life he had Addison's disease. I recollect that previous to his death the diagnosis of an enormously enlarged spleen had been made, and that the displacement of the heart had also been recognized; but my recollection is that it was thought to be due to dilatation."

Dr. Robert Proble, Chicago Medical College: "I have seen four cases of transposition of the viscera—three clinical, one post-mortem. Two of the clinical were stock cases in Vienna, the third is now a student at the Northwestern. In addition to these there is another case, in which the examination is incomplete, discovered while examining the heart for anesthesia."

A Jacobi, College of Physicians and Surgeons, New York: "Only two that I remember."

Dr. Atkinson, Baltimore: "Two cases of transposition of the viscera appearing at my clinic, and who travelled widely, exhibiting themselves."

Dr. C. G. Jennings, Detroit Medical College: "I have never met such a case."

Dr. I. W. Blackburn, National Hospital for the Insane, Washington, reported in the *Washington Medical Annals*, 1902, No. 2, vol. 1., a very interesting case of transposition which came to autopsy. With his permission, an excellent photograph of this case is presented in this article. (Fig. 2.)

Dr. Nancrede, Ann Arbor: "One case, seen in the anatomical laboratory of the University of Pennsylvania, of which I helped to prepare a wax model. This case was reported by Dr. N. Hickman."

FIG. 2.



Transposition of viscera. Terms transposed in description: *a.* Right common carotid artery. *b.* Innominate vein. *c.* Left common carotid artery. *d.* Innominate artery. *e.* Left lung (?). *f.* Right lung (?). *g.* Pulmonary artery. *A.* Aorta. *i.* Right ventricle of heart. *k.* Appendix of right auricle. *l.* Diaphragm. *m.* Right lobe of liver. *n.* Suspensory ligament of liver. *o.* Left lobe of liver. *p.* Gall-bladder. *q.* Cardiac end of stomach and situation of spleen. *r.* Pyloric end of stomach. *s.* Gastrocolic omentum. *t.* Transverse colon dragged downward. *u.* Situation of caecum. *v.* Sigmoid flexure. *w.* Omentum.

Dr. Irving Haynes, Professor of Anatomy, Cornell Medical College: "Although I have superintended the dissection of about 2500 subjects, I have never seen a case of transposition of the viscera."

Dr. Frederic H. Gerrish, Professor of Anatomy, Bowdoin Medical College, Portland, Me.: "I have never encountered a case of transposition of the viscera."

Dr. D. K. Shute, Washington, D.C.: "It has never been my good fortune to see any cases of transposition of the viscera."

Dr. S. Yutzy, Instructor in Anatomy, University of Michigan: "I have seen one case of transposition in ten years' service in the anatomical department. During this period about 750 subjects have been dissected. The case was a middle-aged man."

Members of the staffs at the four Michigan State Asylums inform me that the Pontiac case reported by Dr. Munson is the only case to be found on their records.

The above writers are all men of large experience.

Five well-known internists and four professors of anatomy replied that they had never seen a case of transposition.

Of the thirty-seven cases noted in the above letters all save six were discovered during life. In a few instances (travelling freaks) the same cases have probably been examined and reported by several of the writers. The majority, however, were discovered for the first time, and did not make a practice of exhibiting themselves.

In this country, at least, cases of transposition are nowadays much more frequently discovered during life than after death. Note the contrast between Gruber's report and my own. He collected seventy-nine cases, of which only five or six were discovered during life. In my collection, which simply covers the cases reported in the above letters, together with those with which I am personally familiar, there are forty-four cases, of which thirty-eight were discovered during life.

Report of Unpublished Cases.

CASE I.—Wm. B. consulted me June 13, 1900, complaining of symptoms of indigestion. He is a farmer, aged thirty-two years; is tall, slender, and poorly nourished. On examining his lungs by percussion tympany was encountered in the sixth intercostal space, right nipple line, there being no liver dulness. On the left side dulness is encountered on the sixth rib, nipple line, and eighth rib, mid-axillary line. Litten's phenomenon is present on both sides. Auscultation of both lungs shows good vesicular breathing.

Heart. I was much surprised to find the apex-beat in the fifth intercostal space one inch inside of the right nipple line, easily seen and felt after exercise.

Percussion shows tympany in the normal area for heart dulness. On the right side, however, there is an area of dulness encountered on the fifth rib, sternal line, and extending about one inch to the right; no dulness to the left.

Abdomen. Liver dulness encountered on the left side, nipple line, lower border of the sixth rib; extends down to the margin of the ribs in this line. In middle line, one-third of the distance from ensiform to navel. Just to the right of mid-line liver dulness merges with heart dulness. The liver is not felt.

Spleen. In the right mid-axillary line dulness is encountered at the upper border of the ninth rib, and extends down to the tenth inter-

costal space. It is about the size of a silver dollar. The spleen is not palpable.

Kidneys are not palpable.

Stomach was distended, but unsatisfactorily.

Testicles. Right hangs lower than the left.

CASE II.—A. G. S., dental student, aged twenty-one years, was sent to me by Director Fitzpatrick, of the gymnasium, who suspected some cardiac anomaly. There is no history of disease of the lungs, pleura, or heart. He was never a good distance runner because of shortness of breath. For years he has thought that his heart was on the right side, because he could feel it beating there. This patient is in good health, but does not look robust. Examination of lungs is negative.

Heart. Apex-beat is felt in the fifth intercostal space, just inside of the right nipple; dulness begins on the fourth rib, right sternal line, extends out to right parasternal line. There is no heart dulness on the left or under the sternum. Auscultation is negative except that at times the rhythm is somewhat irregular. The second sound in the right second intercostal space is louder than that in the left. The sounds are heard best to the right, but there are weak heart sounds heard in the location of normal apex-beat.

Abdomen. Liver dulness is encountered on the left side. Upper border, left sternal line, seventh costal cartilage; nipple line, seventh rib; mid-axillary line, eighth intercostal space. This dulness extends down to the margin of the ribs.

Spleen. In outlining the lower border of the right lung I was surprised to find no liver dulness. On percussing in the right mid-axillary line I found a small area of dulness beginning at the ninth rib, extending down about two inches and forward to the anterior axillary line.

Stomach was distended with acid and soda, showing a dislocation. The greater curvature is about three inches below the navel, lesser curvature one inch above. The fundus of the stomach seems to be on the right side, there being a broader area of distention here than on the left.

Colon was distended with air and filled first on the left side, extending about two inches above the navel. There was very little distention on the right side.

Testicles. Left hangs lower than the right.

Spinal Column. No curvature.

X-ray Examination. With the fluoroscope I obtained a good view of the heart beating to the right of the sternum.

CASE III.—I. C., merchant, aged sixty years, patient at the University Hospital. This patient had a chronic bronchitis and chronic rheumatism. He never suspected any dislocation of his organs. He is emaciated. Percussion and auscultation of the lungs reveal signs of emphysema and bronchitis, but of no condition which could have caused a dislocation of his heart to the right.

Heart. Apex-beat cannot be seen or felt on the left side, but in the fifth intercostal space, right side, nipple line, a faint pulsation is seen and felt.

Percussion. Along the left sternal line there is good resonance down to the sixth rib, where liver dulness is encountered. On the right side absolute heart dulness is encountered on the fourth rib, sternal line;

extends to the right, on a level with the fourth rib, to the parasternal line; with the fifth rib to within one inch of the nipple.

Auscultation. Over apex on the right side the sounds are strong; no murmurs are detected. In the second intercostal space, right, the second sound is much accentuated; in the second intercostal space, left, the second sound is very weak.

Abdomen. Unfortunately, a complete examination was not made.

CASE IV.—I am indebted to Dr. Cowie for the following report of this case. S., a travelling salesman, aged fifty years. His symptoms point to a chronic gastritis. An interesting point in his history is the fact that he was examined for life insurance five times without having this anomaly discovered. Examination of the lungs is negative.

Heart. Apex-beat not seen or felt in normal position. There is no dulness to the left of the sternum. Apex-beat is plainly seen and felt in the fifth intercostal space, just inside right nipple.

Auscultation shows heart sounds loudest to the right of the sternum.

Abdomen. In place of liver dulness in right hypochondrium there is a tympanitic note. In this region succussion sounds are brought out by deep palpation. In the left hypochondrium liver dulness is encountered—upper border of nipple line, seventh rib. This extends down to the margin of the ribs and far forward as the sternum.

Stomach. On distention with air it is seen to lie in the right hypochondrium, partially in the epigastrium, near the median line. It is not dislocated downward.

Kidneys are not palpable.

Testicles. The right much lower than the left. The genitals have a right-sided position with trousers on.

CASE V.—The notes on this case are very brief. Patient was colored, male, aged over twenty years; was examined in the out-patient department by Dr. Warthin. The condition of congenital dextrocardia was satisfactorily determined, but so much enthusiasm and interest were manifested in his case that he refused to return for a complete examination of the abdominal viscera, fearing that he was to be subjected to experimentation.

Acquired dextrocardia is a fairly common condition, resulting from contracting disease of the right lung or pleura, which pulls the heart over under the sternum, or even beyond. Again, it may be due to large collections of fluid (serous or purulent) in the left pleural cavity, which push the heart to varying degrees to the right. Inflammatory adhesions may fix the heart in this position, even after the cause has been removed by absorption or operation. A less common cause is the presence of a new-growth involving the left lung and pleura, or mediastinum.

A very striking case of this latter variety came under my observation last spring, in Dr. Dock's clinic. Fig. 3 well illustrates the conditions which were present.

The patient is a small woman, aged forty-five years. She is emaciated, weighing only ninety pounds. Three years ago she weighed about 115 pounds. On inspection of the thorax the left side is a trifle

fuller than the right. On deep breathing expansion is practically limited to the right side. Percussion shows absolute dulness over the entire left chest, front and back, except a very small area at the apex, which gives a tympanitic note. The dulness also extends across the sternum in front to the right parasternal line above the fourth rib, while below this it reaches almost to the nipple line. This dulness and the liver dulness are continuous. As the photograph well shows, resonance was obtained over only a very small part of the thorax in front. Behind, the right lung gives a hyperresonant note over its entire extent down to four fingers below the angle of the scapula. Litten's

FIG. 3.



O—apex-beat. The entire area between the dark lines was absolutely dull.

phenomenon is very distinct on the right, the shadow line moving from the eighth rib down three inches in the mid-axillary line. On the left side it is absent.

Auscultation. Over the dull area, front and axilla, breath sounds are practically absent; behind there is extremely weak vesicular breathing, perhaps conducted from the right side by the spinal column. Over the resonant area of the right lung there is exaggerated vesicular breathing.

The voice sounds are well transmitted over the right resonant area, while practically absent over the left dull area.

Vocal fremitus is very strong over right, but absent over the left chest.

Heart. Apex-beat is felt in the fourth intercostal space, nipple line, right side, most distinctly one inch inside of nipple line. There is also a distinct pulsation in the second and especially in the third intercostal space, right, extending almost to the nipple line.

Heart dullness is continuous with the large area of dullness to the left and below. It extends to within an inch of the right nipple, on a line with the fourth rib.

Auscultation. Over the dislocated apex the first and second sounds are moderately strong. The third intercostal space, right parasternal, first sound is murmurish; second sound is accentuated. Second intercostal space, left, sounds are weak. Pulse is small, of low tension, and regular.

After a consideration of these signs I concluded that there was an enormous collection of fluid in the left pleural cavity, which caused a dislocation of the heart to the right. A large exploratory needle was used twice by the medical interne, Dr. Pray, with no results beyond withdrawing a small amount of blood. Three days later I also used exploratory aspiration twice, but with negative results.

As a result of these findings I came to the conclusion that the cause of the dullness and dislocated organs was a new-growth involving the left pleura, lung, and perhaps the mediastinum.

Another possibility which must be considered is that of an old empyema, with greatly thickened pleura, and a large collection of thick, purulent material. However, it seems most likely that we would have been able to demonstrate pus had it been present.

A striking physical sign was the remarkable clubbing of the fingers, which is shown in the photograph.

The patient came to the hospital complaining of great weakness, a bad cough, and shortness of breath on exertion.

The present illness began four years ago with a cold. She was then troubled with shortness of breath on bending over, with pains in the left side and shoulder. The cough has become much more troublesome during the past two or three years. It has always been dry until a few weeks ago, when the patient caught cold; since then she has raised some sputum. During the past few weeks she has had very little pain in the left side, but there is a feeling as if the lungs were compressed.

During the patient's stay in the hospital her temperature has seldom reached 100° F. She came to the hospital with the diagnosis of consumption. Examination of the sputum for tubercle bacilli while here was always negative. This patient died in January, 1902. Her attending physician, Dr. Fay, of Carlton, Mich., writes me that autopsy revealed an enormous mediastinal tumor, about the shape and size of a medium-sized watermelon.

Another striking case of acquired dextrocardia is well illustrated by Fig. 4. The change in the position of the heart is secondary to an empyema of the left chest of long standing, with extreme retraction of the entire left side. The left side of the chest, with the exception of the apex, does not expand at all. The right side expands fairly well.

Heart. Forcible pulsation is seen to the right of the sternum, in the second, third, fourth, and fifth intercostal spaces; strongest in the fourth. The apex-beat is in the fifth intercostal space, nipple line.

Auscultation. At the apex both first and second sounds are loud and clear-cut. In the second intercostal space, right, the second sound is accentuated. In the second intercostal space, left, both first and second sounds are murmurish. In this area splashing sounds could be heard with each pulsation of the heart during forced inspiration, due in all probability to the sudden movement of the purulent fluid and air in the empyemic cavity (open pneumothorax).

The patient was taken sick in December, 1900. Two months later he noticed the heart beating on the right side, in about the same position which it occupies at present. In December, 1901, Dr. Nancrede resected six ribs. Marked retraction of the left chest followed, but the position of the heart was not altered by the operation.

FIG. 4.



X — areas of cardiac pulsation.

Theories Explaining the Development of Congenital Transposition of the Viscera. These are chiefly of interest to the embryologist and anatomist, and will hardly be understood except by those who have devoted special study to embryology. The following are some of them:

Von Baer explains transposition by the turning of the embryo in the opposite direction—that is, the embryo normally lies on the left

side of the umbilical vesicle; but if it lies on the right side, then we have transposition. According to him, this occurs at the beginning of the developmental period.

Förster considers situs inversus a malformation in which the transposition of the Anlagen takes place in the first embryonal formation. In the double monster the fœtus of the right side shows a complete transposition, while the fœtus on the left side shows a normal situs.

Rindfleisch believes that the spiral turning of the blood column is responsible for the displacement of the heart. Normally it flows from left to right, but in situs inversus an opposite direction must obtain. The asymmetry of the heart is made responsible for all asymmetry in the animal body.

Virchow emphasizes the influence of the umbilical cord. In situs inversus it is wound spirally to the right; in the situs solitus to the left.

Küchenmeister thinks that the location of the fertilized disk at the surface of the egg is the essential thing. The normal situs in single birth probably depends upon the growth of the germ from below upward instead of from above downward. He says that from this it must be self-evident that the turning of the embryo has been inverted. This must also affect the later spleen side and the side of the arterial heart. Concerning the congenital partial situs viscerum—solito inversus—which shows itself either in the chest or belly, but not in both places at the same time, he believes that the growth, on the whole, follows the type for the situs inversus. The rarer partial situs is an inhibition formation which grows according to the type of the normally projected embryo.

Martinotti in the transversus of the single born emphasizes the condition of the vena omphalomesenterica, first mentioned by Dareste. The direction which the heart loop takes depends upon the dissimilar growth of the two halves of the vascular area. Under normal conditions a dissimilar formation of the two halves exists. The left omphalomesenteric vein is more developed than the right; the right gradually disappears. The heart reacts in a very sensitive way toward the cause of situs transversus.

Marchand says that the loop formation of the venæ omphalomesenterica about the intestines under normal conditions prevents the intestines from slipping toward the right; so a right turning takes place if the loop formation is absent. He considers the left-sided persistent vena omphalomesenterica the cause of the right position of the stomach. In a more recent article Marchand does not believe that the development of the vena omphalomesenterica can have an influence upon the rotation of the stomach.

Lochte advances the view that the growth of the organ, considered in the sense of situs solitus, is associated with a persistence of left-sided omphalomesenterica and umbilical veins, while those of situs transversus totalis, on the other hand, are associated with corresponding right-sided veins.

To the clinician, transposition of the viscera presents many interesting problems in differential diagnosis. The displacement of the heart to the right makes it necessary to examine the lungs and pleura carefully in order to exclude acquired displacements. The discovery of an enlarged area of dulness in the left hypochondrium suggests a number of possibilities. It is most likely an enlarged spleen, either of leukæmia, malaria, splenomegaly, etc. This point is illustrated by actual cases in practice. In Munson's case, referred to above, the diagnosis of an enormously enlarged spleen had been made, and the displacement of the heart was thought to be due to dilatation.

In the normal patient it is a very common experience to find an entire absence of liver dulness in the right hypochondrium. It is also common to find the apex-beat neither seen nor felt on the left side, especially if the patient is quiet and in the horizontal position. Heart dulness is also frequently absent. So it is easy to understand how these cases of transposition are often overlooked.

It is possible to mistake an aneurism of the arch for a dislocated heart. This fact was recently brought to my attention.

Gruber refers to the following errors in diagnosis: In one case of transposition a pain in the right hypochondrium led to the diagnosis of a chronic inflammation of the liver. In another case a soldier was wounded in a duel in the right hypochondrium; from the position of the wound and the vomiting of green fluid it was thought that the liver had been penetrated. In a third case in the Würzburg clinic the transposed liver was diagnosed as a splenic tumor. In a fourth case—one of a cancer of the pylorus in a transposed stomach—the hard tumor felt deep in the left hypochondrium, and was thought to belong to the stomach or the pancreas.

Gruber arrived at a number of interesting conclusions from a study of 79 cases. Concerning the sex, there were 49 men, 19 women, and 11 in which sex was not mentioned. These individuals lived as long as those with normally placed organs; 5 of the 19 women lived to an age between 70 and 84 years. The women were normally fruitful; one gave birth to twelve children. Among the 79, 4 died an unnatural death, and only 4 were extremely malformed. There was transposition of both chest and abdominal organs in 71; of the abdominal organs alone in 8. In the first kind the transposition was complete, in the latter incomplete. Lungs were transposed in 35 of 71 cases;

the right had two lobes and the left three. In 2 cases they were not transposed; in 2 both lungs had two lobes; in 1 the right had one lobe and the left 2 lobes. Spine: curvature of the dorsal portion is mentioned in only 11 cases. In 7 of these it was to the left; in four to the right, as normally. We cannot draw the conclusion that persons with transposition are more likely to be left-handed than those with normally located viscera. The position of the testicle was mentioned only 7 times. In 4 the right was lower; in 1 the left; in 1 the left had not descended. The lower position of the right testicle is unimportant as a sign of situs inversus. In only 9 cases were there notes on the position of the kidneys. In 7 the left was lower, in 2 the right. In 32 cases in which the vessels arising from the arch of the aorta are mentioned these were transposed 29 to 30 times.

II. Steinhilber mentions the fact that in the operation of œsophagotomy it is well to know that the œsophagus lies over the right trachea in persons with transposition.

In situs partialis the transposition of the abdominal organs may be very irregular. In one case the stomach and duodenum were normally located, while the other organs were transposed. In another case the liver alone was transposed.

In 1888 a case of pure dextrocardia, with congenital pulmonary stenosis, without malposition of the viscera in general, was shown to the Vienna Medical Society by Dr. Gruss. In discussing the case, Von Bamberger concurred in the diagnosis, and remarked that Professor Schrötter had lately stated that no single case of pure dextrocardia had ever been proved; whereas all anatomists of experience—for example, Rokitsansky, Friedberg, Förster, etc.—had mentioned such cases, and he himself had seen two.

The above quotation emphasizes the fact that partial situs is a much rarer condition than complete. If the transposition is located in the abdominal cavity it will most likely be overlooked in the physical examination.